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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,778	06/19/2001	Richard R. Hall	END920000187US1	2338

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EXAMINER

DINH, TUAN T

ART UNIT PAPER NUMBER

2827

DATE MAILED: 07/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/884,778

Applicant(s)

HALL ET AL.

Examiner

Tuan T Dinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-24 and 27-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-24 and 27-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. The request filed on 04/25/03 for a Request for Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 09/884,778 is acceptable and a RCE has been established. An action on the RCE follows.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the ***range of 50 to 150 words***. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 27, 30-32, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Reimann (U. S. Patent 4,663,497).

As to claims 27, 30, Reimann discloses a structure for interconnection between circuit layers as shown in figures 1-14 comprising:

a laminate (22 and 34) having a conductive inner plane; and

a conductive element (38-figure 5), which is a sphere or a cylinder (see figures 1-8 and 13) embedded into an opening (or hole 26, see figure 2) of the laminate, wherein a portion of the conductive element (see figure 5 and 7) formed at least one contact pad (40) **extending beyond** a surface of the laminate (22, 34), wherein the conductive element includes an inner element (40) covered by an outer element (42, see figure 8).

As to claims 31, 35, Reimann discloses the structure as shown in figures 1-8 wherein the outer and inner elements (42, 40) of the conductive element are copper/brass and rubber/plastic respectively.

As to claim 32, Reimann discloses the structure as shown in figures 1-8 wherein the laminate is epoxy (column 3, lines 38-40).

5. Claim 37 is rejected under 35 U.S.C. 102(e) as being anticipated by Curcio et al. (U. S. Patent 6,504,111).

Curcio discloses a structure as shown in figures 4-7 comprising:

a first laminate (12A, column 2, line 36) having a first conductive element (20A, column 2, line 51) embedded into the first laminate (into a through hole (14A), wherein a

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portion of the first conductive element forms at least one contact pad (22A, 22B, column 2, line 59) extending beyond a surface of the first laminate;

a second laminate (12B) having a second conductive element (20B) embedded into the second laminate (into a through hole (14B), wherein a portion of the second conductive element forms at least one contact pad (22C, 22D) extending beyond a surface of the second laminate; and

a bonding layer (36) between the first and second laminates, wherein the contact pads (22A, 22C) are electrical connected.

6. Claims 36, 38-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Lloyd (U. S. Patent 3,601,523).

As to claim 36, Lloyd discloses a method of forming a conductive path within a laminate as shown in figures 1-6 comprising:

providing an opening (14, column 2, line 72) in the laminate (10, column 2, lines 65-67);

pressing a conductive element (15, column 3, line 9) into the opening (14) such that a portion of at least one end of the conductive element extends beyond a surface of the laminate (see figures 3-4);

applying a compressive pressure to the at least one end of the conductive element (column 3, lines 20-24) whereby the compressive pressure applied to the at least one end of the conductive element (15) forms a contact pad (35, 37, column 3, lines 37-38) extending beyond a surface of the laminate (10).

As claim 38, Lloyd discloses a method of forming a conductive path within a laminate as shown in figures 1-6 comprising:

providing the laminate (10-, column 2, lines 65-67);

projecting a conductive element (conductive adhesive 15, column 3, lines 9-10) toward a surface such that the conductive element moves toward the laminate (see figures 2-4); wherein the conductive element becomes embedded within the laminate.

As to claims 39-40, Lloyd discloses the method as shown in figures 4-6 wherein the conductive element (15) is sphere, and the entire the conductive element (15) becomes embedded within the laminate (10).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 21-24 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lloyd ('523) in view of Watanabe et al. (U. S. Patent 5,319,159).

As to claim 21-24, Lloyd discloses the method of forming a conductive path within a laminate as shown in figures 1-6 comprising:

providing an opening or a hole (14, column 2, line 72) in the laminate (10, column 2, lines 65-67);

pressing a conductive element (15, column 3, line 9), which is a sphere or cylinder, into the opening (14) such that a portion of at least one end of the conductive element extends beyond a surface of the laminate (see figures 3-4);

applying a compressive pressure to the at least one end of the conductive element (column 3, lines 20-24) whereby the compressive pressure applied to the at least one end of the conductive element (15) forms a contact pad (35, 37, column 3, lines 37-38) extending beyond a surface of the laminate (10).

Lloyd does not disclose the conductive element includes an inner element covered by an outer element.

Watanabe shows a conductive element (6, 9, see figure 1c, and 1f) including an inner element (9) covered by an outer element (6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have teaching's Watanabe to employ the method of Lloyd in order to provide a strong bond of wiring patterns structure of a multiplayer circuit board.

As to claims 33-34, Watanabe shows in column 4, figures 1c-1g wherein the inner element of the conductive element (6) comprises a copper, and the outer element of the conductive element (9) comprises a plastic.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have teaching's Watanabe in claims 33-34 to employ the method of Lloyd in order to improve an electrical-insulation connection for the path structure.

9. Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reimann (497) in view of Lloyd (U. S. Patent 3,601,523).

As to claims 28-29, Reimann does not teach the conductive element pressed into the opening of the laminate. Lloyd teaches a laminate (10) having an opening or a hole (14) wherein a conductive element (15) pressed into the opening (14) disclosed in figures 1-6, see column 3.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have teaching's Lloyd to employ the structure of Reimann in order to provide a low resistance through hole of a multiplayer structure.

Response to Arguments

10. Applicant's arguments with respect to claims 21-24 and 27-40 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T Dinh whose telephone number is 703-306-5856. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-1341 for regular communications and 703-305-1341 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

TD
July 24, 2003.

John B. Vigushin
John B. Vigushin
Examiner
AU 2827